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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/064,051	06/05/2002	Anchor Chen	NAUP0486USA	9791
27765	7590	11/20/2003	EXAMINER	
NAIPO (NORTH AMERICA INTERNATIONAL PATENT OFFICE) P.O. BOX 506 MERRIFIELD, VA 22116			LANDAU, MATTHEW C	
			ART UNIT	PAPER NUMBER
			2815	

DATE MAILED: 11/20/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/064,051

Applicant(s)

CHEN, ANCHOR

Examiner

Matthew Landau

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 September 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-7, 9 and 11-15 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 11-15 is/are allowed.
- 6) ☒ Claim(s) 1-7 and 9 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 05 June 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
- a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 3, 7, 9, and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Imai in view of Oda et al. (US Pat. 6,521,974, hereinafter Oda).

In regards to claim 1, as best the examiner can ascertain the claimed invention, Figure 2 of Imai discloses a bipolar junction transistor (BJT) comprising: a substrate 14; a dielectric layer (20,16) formed on a predetermined region of the substrate; an opening formed in the dielectric layer, and a portion of the substrate being exposed; a heavily doped polysilicon layer 32 formed on a sidewall of the opening and on the substrate to define a self-aligned base region (32,30a,36) in the opening; an intrinsic base doped region 36 formed within the substrate and in a bottom of the opening; a spacer 34 formed on the heavily doped polysilicon layer to define a self-aligned emitter region in the opening; and the self-aligned emitter region being filled with an emitter conductivity layer (38,40) and a PN junction being formed between the emitter conductivity layer and the intrinsic base doped region (column 4, lines 12-15). The difference between Imai and the claimed invention is an oxide layer and a silicon nitride layer stacked on the dielectric layer. Figure 1 of Oda discloses an oxide layer 7 and a silicon nitride layer 8 stacked on a

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dielectric layer 4. In view of such teaching, it would have been obvious to the ordinary artisan at the time the invention was made to modify the invention of Imai by including oxide and nitride layers stacked on the dielectric layer as taught by Oda for the purpose of providing additional isolation from the substrate.

In regards to claim 3, Imai discloses the substrate 14 is silicon (column 3, lines 1-3).

In regards to claim 7, Figure 2 of Imai discloses an extended conductivity layer 22 formed on the dielectric layer (20/16) electrically connected to the heavily doped polysilicon layer. It is further obvious in the invention of Imai and Oda by including the oxide and nitride layers between the extending poly layer and the dielectric layers as taught by Oda (Figure 1) for the purpose of providing additional isolation from the substrate.

In regards to claim 9, Imai discloses the extended conductivity layer is composed of in-situ doped polysilicon (column 3, lines 5-15).

Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Imai in view of Fitch et al. (US Pat. 5,213,989, hereinafter Fitch).

In regards to claim 2, the difference between Imai and the claimed invention is the heavily doped polysilicon layer is doped with a boron dopant. Fitch discloses boron is conventionally used as a p-type dopant (column 7, lines 5-8). The heavily doped region 32 of Imai is p-type. In view of such teaching, it would have been obvious to the ordinary artisan at the time the invention was made to modify the invention of Imai by using boron as the dopant in the heavily doped polysilicon region for the purpose of obtaining a p-type region. A further difference between Imai and the claimed invention is the dosage ranging from $1E19$ to $1E21$. It

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would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the invention of by, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. In re Aller, 105 USPQ 233. The ordinary artisan would have been motivated to modify in the manner described above for the purpose of decreasing resistance of the base electrode.

Claims 4 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Imai in view of Chuang et al. (US PGPub 2003/0096486, hereinafter Chuang).

In regards to claim 4, the difference between Imai and the claimed invention is the substrate is a non-selective epitaxial substrate. Figure 1A of Chuang discloses a non-selective epitaxial layer 102. In view of such teaching, it would have been obvious to the ordinary artisan at the time the invention was made to modify the invention of Imai by using a non-selective deposition method layer for the epitaxial substrate. The ordinary artisan would have been motivated to modify Imai in the manner described above for the purpose of depositing the epitaxial layer.

In regard to claim 5, the difference between Imai and the claimed invention is a silicide layer formed on the emitter conductivity layer. Figure 2H of Chuang discloses a silicide layer 222 formed on an emitter conductivity layer 212a. In view of such teaching, it would have been obvious to the ordinary artisan at the time the invention was made to modify the invention of

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Imai by including a salicide layer on the emitter conductivity layer for the purpose of decreasing the contact resistance.

Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Imai in view of Jambotkar.

In regards to claim 6, the difference between Imai and the claimed invention is a selective implant collector (SIC) region formed in the substrate beneath the intrinsic base doped region. Figure 1B of Jambotkar discloses a SIC region 31 below an intrinsic base region 33. In view of such teaching, it would have been obvious to the ordinary artisan at the time the invention was made to modify the invention of Imai in the manner described above for the purpose of minimizing the series collector resistance (column 6, lines 66-68).

Allowable Subject Matter

Claims 11-15 are allowed.

Response to Arguments

Applicant's arguments filed September 24, 2003 have been fully considered but they are not persuasive.

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In response to Applicant's arguments that the structure of amended claim 1 is different from that of Imai because Imai discloses the "polysilicon film 32 is formed on the sidewall of the oxide film 20 and on the surface of the P+-type external base 30a", the polysilicon film 32 of Imai is connected to the substrate via base region 30a. Therefore, it can be considered the polysilicon film 32 is "on" the substrate. The claim does not require the polysilicon layer to be in direct contact with the substrate.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matthew C. Landau whose telephone number is (703) 305-4396.


The examiner can normally be reached from 8:30 AM - 5:30 PM. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Thomas can be reached on (703) 308-2772. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9306 for regular communications and (703) 872-9306 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

Matthew C. Landau

Examiner

November 17, 2003



BEROME JACKSON
PRIMARY EXAMINER